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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,882	12/03/2003	Mehmet Arik	RD30892/130333	5383
7590 02/02/2006			EXAMINER	
Scott A. McCollister Fay, Sharpe, Fagan Minnich & McKee, LLP, 7th Floor 1100 Superior Avenue Cleveland, OH 44114-2518			HAN, JASON	
			ART UNIT	PAPER NUMBER
			2875	
DATE MAILED: 02/02/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/726,882

Applicant(s)

ARIK ET AL.

Examiner

Jason M. Han

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16,28-31,34 and 35 is/are rejected.
- 7) ☒ Claim(s) 17-27,32 and 33 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to Claims 1-35 have been considered but are moot in view of the new ground(s) of rejection.

The following claims have been rejected in light of the specification, but rendered the broadest interpretation as construed by the Examiner [MPEP 2111].

Claim Objections

2. Claim 35 is objected to because of the following informalities: Applicant recites the limitation, "a particular LED", which renders indefiniteness and uncertainty with respect to only one LED being cited in Claim 34. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-16 and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belliveau (U.S. Patent 6357893) in view of Tanuma et al. (U.S. Patent 5008582).
4. With regard to Claims 1-2, Belliveau discloses an LED lighting assembly including:

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- A housing [Figure 12C: (970)];
- An LED [Figure 12C: (912a)] disposed in said housing;
- A heat dissipating structure [Figure 12C: (912)] in thermal communication with said LED (inherent given the electrical connections); and
- A fluid current generator [Figure 12C: (2270)] disposed in said housing for creating current over said heat dissipating structure.

Belliveau does not specifically teach the fluid current generator including a piezoelectric material (re: Claim 1), nor specifically teaches the structural details of the fluid current generator including a blade comprising a flexible material, wherein the blade is spaced from a surface of the heat dissipating structure such that an unattached end of the blade can move in relation to the surface (re: Claim 2).

Tanuma teaches, "In an electric device having a package including-[ed] an electric circuit element therein, a cooling fan is fixed on the package directly. The fan is formed of piezoelectric elements and a flexible cooling fin. The fan generates the cooling air flow due to vibration of the piezoelectric elements [Abstract]." In addition, Tanuma teaches the cooling fan including a blade [Figure 18: (21)] of flexible material, wherein the blade is spaced from a surface [Figure 18: (40)] of a heat dissipating structure [Figure 18: (11, 40, 41)] such that an unattached end of the blade can move in relation to the surface.

It would have been obvious to one ordinarily skilled in the art at the time of invention to modify the LED lamp assembly of Belliveau with the cooling system/fluid current generator of Tanuma in order to ensure conditions [e.g., cooled surface] for

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efficient illumination of the light emitting diode [see Tanuma: Description of the Prior Art], whereby the piezoelectric fan produces a sufficient airflow without the noise commonly associated with motor fans.

5. With regards to Claim 3, Belliveau in view of Tanuma discloses the claimed invention as cited above. In addition, Tanuma teaches a pedestal [Figure 21: (28)] extending from the surface of the heat dissipating structure [Figure 21: (11, 40)], wherein the blade is attached to the pedestal such that the blade is spaced from the surface [Figure 19].

6. With regards to Claim 4, Belliveau in view of Tanuma discloses the claimed invention as cited above. In addition, Tanuma teaches the pedestal having a width at least equal to the width of the blade [Figure 20].

7. With regards to Claim 5, Belliveau in view of Tanuma discloses the claimed invention as cited above. In addition, Tanuma teaches the pedestal preventing axial current flow between the blade and the surface at an end of the blade that attaches to the pedestal [Figure 18: obvious by disposition].

8. With regards to Claim 6, Belliveau in view of Tanuma discloses the claimed invention as cited above. In addition, Tanuma teaches a piezoelectric material [Figure 5: (20)] running at least substantially the length of the blade [Figure 5: (19)].

9. With regards to Claim 7, Belliveau in view of Tanuma discloses the claimed invention as cited above. In addition, Tanuma teaches a plurality of fins [Figure 25: (40)] extending from the surface of a heat dissipating structure [Figure 25: (11)].

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10. With regards to Claim 8, Belliveau in view of Tanuma discloses the claimed invention as cited above. In addition, Tanuma teaches a pedestal [Figure 27: (28)] extending from the surface, wherein the blade mounts to the pedestal.

11. With regards to Claim 9, Belliveau in view of Tanuma discloses the claimed invention as cited above. In addition, Tanuma teaches the pedestal [Figure 27: (28)] being spaced from the plurality of fins [Figure 27: (40)] to define a gap between the plurality of fins and the pedestal.

12. With regards to Claim 10, Belliveau in view of Tanuma discloses the claimed invention as cited above. In addition, Tanuma teaches the pedestal preventing axial current flow between the blade and the surface at an end of the blade that attaches to the pedestal [Figure 18: obvious by disposition].

13. With regards to Claim 11, Belliveau in view of Tanuma discloses the claimed invention as cited above. In addition, Tanuma teaches the heat dissipating structure [Figure 25: (11)] including a cavity [Figures 25&27: between (28) and (40)] defining an opening, whereby the cooling fan includes a blade [Figures 25&27: (19)] that covers a portion of the opening.

14. With regards to Claim 12, Belliveau in view of Tanuma discloses the claimed invention as cited above. In addition, Tanuma teaches the cavity being defined by an end wall that impedes axial current flow [Figures 25&27: (40)].

15. With regards to Claim 13, Belliveau in view of Tanuma discloses the claimed invention as cited above. In addition, Tanuma [Description of the Prior Art] teach a heat dissipating structure including a printed circuit board.

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16. With regards to Claim 14, Belliveau in view of Tanuma discloses the claimed invention as cited above. In addition, Tanuma teaches a blade [Figure 25: (19)] having a flexible material [Figure 25: (21)] attached to a piezoelectric material [Figure 25: (20)], wherein the flexible material is substantially the same length as the piezoelectric material.

17. With regards to Claim 15, Belliveau in view of Tanuma discloses the claimed invention as cited above. In addition, Tanuma teaches the heat dissipating structure including a flow path surface [Figure 27: left side of (28) and (40)] defining the opening and the blade mounting substantially flush with the surface.

18. With regards to Claim 16, Belliveau in view of Tanuma discloses the claimed invention as cited above. In addition, it is obvious that due to the disposition of the blade [Figure 27: (21)] and the cavity [Figure 27: between (28) and (40)] that the fluid current generator would produce a vortex shaped current around the flow path surface. It should further be noted that it has been held that the recitation that an element is "adapted to" perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138.

19. With regards to Claim 28, Belliveau in view of Tanuma discloses the claimed invention as cited above. In addition, Tanuma teaches, "To overcome these problems, other conventional constructions having lower thermal resistance have been utilized, and cooling fins have been fixed on the electronic devices" [Column 1, Lines 44-47].

Though Belliveau in view of Tanuma does not specifically teach a plurality of fins extending from said heat dissipating structure, it would have been obvious to one ordinarily skilled in the art at the time of invention to modify the heat dissipating structure of Belliveau in view of Tanuma to further incorporate the commonly known plurality of fins to expand the surface area and enhance overall heat transfer or dissipation away from the LED.

20. With regards to Claim 29, Belliveau in view of Tanuma discloses the claimed invention as cited above, but does not specifically teach said fins radiating from a central point of said heat dissipating structure. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to position the fins to radiate from a central point of said heat dissipating structure, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japiske*, 86 USPQ 70. In this case, it is obvious that one would want to optimize heat transfer, whereby extending the fins radially outward from a central point ensures the heat may transfer towards an outside position closer to the housing.

21. With regards to Claim 30, Belliveau in view of Tanuma discloses the claimed invention as cited above. In addition, Belliveau teaches the fluid current generator [Figure 12C: (2270)] being positioned adjacent the central point of said heat dissipating structure [Figure 12C: (912)]. It is also obvious that one would want to position said generator at or adjacent to the heat dissipating structure so as to ensure appropriate airflow across thereof.

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22. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Belliveau (U.S. 6357893) in view of Tanuma et al. (U.S. Patent 5008582) as applied to Claim 28 above, and further in view of Edelman et al. (U.S. Patent 4501319).

Belliveau in view of Tanuma discloses the claimed invention as cited above, but does not specifically teach the structural details of the fluid current generator including a plurality of openings for creating a plurality of fluid currents.

Edelman discloses a piezoelectric polymer heat exchanger having multiple flexible plates [Figure 3A: (20)] being connected by a rectangular housing/hinge [Figure 3A: (10)]. In addition, Edelman teaches a fluid current generator with a plurality of openings [Figures 3A-3B].

It would have been obvious to one ordinarily skilled in the art at the time of invention to modify the LED lamp assembly of Belliveau in view of Tanuma to incorporate the plurality of openings for creating a plurality of fluid currents, as principally taught by Edelman, so as to alter the fluid dynamics and provide greater control via multiple currents in cooling the assembly.

23. Claims 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belliveau (U.S. Patent 6357893) in view of Glezer et al. (U.S. Patent 6588497).

Belliveau discloses an LED lighting assembly including:

- A housing [Figure 12C: (970)];
- An LED [Figure 12C: (912a)] disposed in said housing;
- A heat dissipating structure [Figure 12C: (912)] in thermal communication with said LED (inherent given the electrical connections); and

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- A fluid current generator [Figure 12C: (2270)] disposed in said housing for creating current over said heat dissipating structure.

Belliveau does not specifically teach the structural details of the fluid current generator being a synthetic jet actuator disposed in the housing, which is aimed to provide a current of fluid for the LED.

Glezer teaches a thermal management system utilizing a synthetic jet actuator for cooling the system [Abstract].

It would have been obvious to one ordinarily skilled in the art at the time of invention to modify the LED lamp assembly of Belliveau to incorporate the synthetic jet actuator of Glezer aimed at the LED in order to provide a cooling means for the lamp without the use of a fan, which typically produces loud noises. To quote Glezer, "Traditionally, the need for cooling microelectronic devices has been met by using forced convective cooling with or without heat sink devices. Forced convection is effected using fans which provide either global overall cooling or locally-based cooling... Use of a fan also requires relatively large moving parts in order to have any success in cooling a heated body or microelectric component. These large moving parts naturally require high power inputs [Column 1, Lines 39-49]."

It should further be noted that Belliveau teaches, "Ventilation holes are strategically placed in the substrate as to provide airflow either by a forced air system or by convection and to assist in dissipation of unwanted heat that is generated by the light sources and increase the life of the light sources" [Column 3, Lines 15-19]. It is

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therefore obvious that one could easily implement the synthetic jet actuator of Glezer as a forced air system into the lamp assembly of Belliveau.

Allowable Subject Matter

23. Claims 17-25, 26-27, 32, and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

24. The following is a statement of reasons for the indication of allowable subject matter: With regard to Dependent Claims 17, 26, 32, and 33, the Applicant commonly recites the fluid current generator including a first and second side plate being connected by a flexible hinge. The prior art of record fails to teach or suggest the combination of structural elements, specifically the abovementioned details of the fluid current generator, claimed herein, and all subsequent dependent claims are allowed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Han whose telephone number is (571) 272-2207. The examiner can normally be reached on 8:00am-5:00pm.

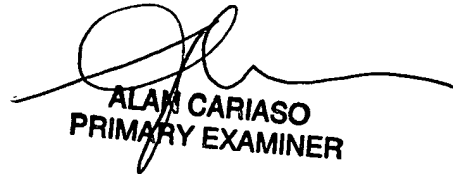
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (571) 272-2378. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason M Han
Examiner
Art Unit 2875

JMH (1/27/2006)


ALAN CARIASO
PRIMARY EXAMINER